U.S. Forest Service

RESEARCH NOTE

CENTRAL STATES FOREST EXPERIMENT STATION
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ADVENTITIOUS BUD CLUSTERS DO NOT DEGRADE BLACK CHERRY LOGS

In 1955, the National Hardwood Lumber Association decided that "When cherry is sold and specified 'sapwood, gum spots, and streaks no defects,' small knots or their equivalent not exceeding 1/8 inch in diameter shall be admitted in the cuttings."[1/] Nearly all black cherry lumber is graded by this rule.

However, in the U.S. Forest Service Standard Grades for Hardwood Factory Lumber Logs,[2/] which are applied to cherry among other species, most adventitious bud clusters and bark distortions are considered as log grading defects even though they usually indicate only the small knots that are no longer considered to be lumber defects.

In this study two trial modifications of defect interpretation were evaluated to determine if adventitious bud clusters and bark distortions on a cherry log should affect its grade. Results indicate that most of these surface abnormalities should not be recognized as log grading defects. This report contains lumber grade yields and overruns based on a modification that disregards nearly all adventitious bud clusters and bark distortions.

1/ Rules for the measurement and inspection of hardwood lumber, cypress veneers and thin lumber. (Published biennially by National Hardwood Lumber Association, Chicago, Illinois.)

2/ Hardwood log grades for standard lumber. U.S. Forest Service Forest Prod. Lab. Rep. D 1737. 1959.

Procedure

About 200 black cherry logs from each of three locations in the northeast were diagrammed and scaled. The logs from each location were hauled to a different mill and sawed so that lumber of the highest grade possible was obtained. A National Hardwood Lumber Association inspector graded the lumber following air drying, and a board tally was kept that included log number and board grade, thickness, and surface measure. The log diagrams were graded using the defect interpretation of the Forest Service Standard Grades and using the following two modifications:

Modification A. Standard log grading except that adventitious buds and bud clusters and bark distortions are admitted to the clear-face cutting as follows:

a. Disregard adventitious bud clusters up to and including 1 1/2 x 1 1/2 inches on logs 15 inches and larger.

b. Disregard adventitious buds and bud clusters up to 1/2 x 1/2 inch on all logs.

c. Disregard light and medium bark distortions on all logs and heavy bark distortions on butt logs 15 inches and larger.[3/]

Modification B. Standard grading, except:

a. Disregard all adventitious buds and bud clusters on all logs.

b. Treat bark distortions as under Modification A.

Statistical comparisons between the effectiveness of Modifications A and B and the standard method as predictors of value were made (see Appendix).

3/ For a definition of light, medium, and heavy bark distortions see: Bulgrin, Erwin H. Hardwood tree diagraming Manual. U.S. Forest Serv. Cent. States Forest Exp. Sta. Manual No. 1, p. 16.

Results and Discussion

Both Modifications A and B, which disregarded various adventitious bud clusters and bark distortions, were more satisfactory than the standard interpretation of the rules for the logs sawed at one of the three mills. At the other two mills there was no significant difference between the standard method of defect interpretation and Modification A or B. As a result, both trial methods were declared to be improvements over the recognized standard; they were better predictors of value in one example and no worse in the other two.

The two modifications gave very similar results so Modification B is recommended as the approved way to treat adventitious bud clusters and bark distortions when grading black cherry logs because it is easier to use.

Dry Lumber Grade Yields

For the 654 logs involved in this study, dry lumber grade yields expressed as a percent of total dry tally and percent overrun for the International 1/4-Inch Log Rule were computed by log grade and scaling diameter (table 1). The yields together with lumber thickness distributions (table 2) and current lumber prices may be used to estimate the value of lumber that can be sawed from black cherry logs. By following recognized sawmill practices it should be possible to obtain comparable yields from cherry logs that have been carefully scaled and graded by the U.S. Forest Service Standard Grades for Hardwood Factory Lumber Logs.

APPENDIX (Statistical Analysis)

We divided the logs from each sample into two groups of equal size by log grade and scaling diameter. One group was graded using the standard Forest Service method of defect interpretation, and the other using both Modifications A and B. The use of two groups permitted valid statistical comparisons between Modifications A and B and the standard method as predictors of value.

Table 1.--Dry lumber grade yields and overruns for black cherry by log grade and scaling diameter[1/]

LOG GRADE NO. 1

Scaling diameter (inches)	No. of logs	Total dry tally	International 1/4-inch log rule: Scale: Gross	Net	Overrun	Lumber grade (percent of total dry tally): Fas	Sel	1C	2C	3A	3B
		Board feet	Board feet	Board feet	Percent						
13	17	1,508	1,520	1,475	2.2	29.6	27.8	15.6	13.7	7.1	6.2
14	20	2,173	2,125	2,095	3.7	31.2	28.2	16.0	12.3	8.7	3.6
15	18	2,248	2,360	2,285	- 1.6	42.5	20.0	14.6	14.3	6.4	2.2
16	23	3,107	3,220	3,110	- .1	39.4	18.2	16.5	16.1	6.0	3.8
17	21	2,985	3,130	3,030	- 1.5	31.4	24.8	22.6	10.4	7.0	3.8
18	13	2,015	2,120	2,030	- .7	43.8	18.5	17.5	11.3	3.9	5.0
19	13	2,606	2,610	2,560	1.8	39.1	21.6	17.3	11.4	5.4	5.2
20	10	2,182	2,195	2,100	3.9	25.2	31.8	19.7	13.2	7.0	3.1
21	1	211	195	195	8.2	19.0	35.1	21.8	14.7	4.7	4.7
22	3	745	735	725	2.8	58.5	18.3	6.2	4.3	4.3	8.4
24	2	425	565	475	-10.5	49.4	17.9	19.0	3.8	1.2	8.7
25	2	536	620	560	- 4.3	51.1	20.2	14.4	2.2	5.8	6.3
						----------Total tally----------					
Total	143	20,741	21,395	20,640	0.5	7653	4812	3585	2510	1283	898

LOG GRADE NO. 2

10	7	354	355	355	- 0.3	12.7	21.5	22.3	18.6	16.1	8.8
11	32	1,721	1,730	1,645	4.6	6.3	12.5	30.0	25.3	14.7	11.2
12	53	3,433	3,575	3,435	- .1	8.6	17.0	25.1	26.2	15.4	7.7
13	42	3,165	3,320	3,180	- .5	8.3	15.7	31.9	23.5	14.7	5.9
14	34	2,728	2,925	2,810	- 2.9	13.3	17.9	30.1	19.8	11.7	7.2
15	28	2,808	3,005	2,920	- 3.8	9.5	18.7	34.3	22.0	9.6	5.9
16	16	1,638	1,780	1,720	- 4.8	10.4	15.4	36.0	18.6	7.0	12.6
17	9	1,214	1,280	1,235	- 1.7	12.3	20.3	37.4	18.4	8.4	3.2
18	7	907	965	915	- .9	12.0	18.6	38.0	18.8	7.4	5.2
19	6	965	1,180	1,070	- 9.8	14.4	14.3	38.3	18.8	7.5	6.7
20	5	879	945	865	1.6	10.0	19.9	35.7	17.7	11.5	5.2
21	2	308	350	275	12.0	27.3	23.4	25.3	14.6	4.9	4.5
23	1	143	185	185	-22.7	60.8	16.1	16.1	2.8	3.5	.7
						----------Total tally----------					
Total	242	20,263	21,595	20,610	- 1.7	2170	3458	6423	4384	2368	1460

LOG GRADE NO. 3

8	31	632	615	565	11.9	--	2.7	4.6	32.4	36.9	23.4
9	43	1,313	1,245	1,195	9.9	--	3.4	11.2	39.0	30.4	16.0
10	53	2,096	2,130	2,050	2.2	1.4	3.5	16.2	42.7	27.9	8.3
11	40	1,691	1,840	1,730	- 2.3	.8	4.1	19.6	38.8	25.3	11.4
12	39	2,084	2,210	2,085	.0	1.1	4.0	24.4	36.1	20.8	13.6
13	18	1,127	1,265	1,160	- 2.8	1.9	8.2	24.2	39.5	16.8	9.4
14	20	1,547	1,635	1,565	- 1.2	6.2	9.8	26.6	32.1	14.6	10.7
15	8	535	670	580	- 7.8	4.3	5.4	32.2	36.1	11.2	10.8
16	8	743	845	785	- 5.4	7.0	7.6	39.2	22.9	12.4	10.9
17	1	105	125	125	-16.0	12.4	14.3	39.1	3.8	19.0	11.4
18	5	493	610	545	- 9.5	13.4	7.3	41.8	19.1	9.5	8.9
19	1	105	125	115	- 8.7	--	--	76.2	12.4	2.8	8.6
20	1	143	175	155	- 7.7	38.4	16.8	16.1	16.1	8.4	4.2
22	1	165	215	195	-15.4	5.4	25.5	24.9	17.6	5.4	21.2
						----------Total tally----------					
Total	269	12,779	13,705	12,850	- 0.6	402	737	2893	4487	2736	1524

1/ Logs were graded in accordance with Modification B.

Table 2.--Distribution of the lumber grade yields shown in Table 1 by log grade and lumber thickness

LOG GRADE NO. 1

Lumber thickness (inches)	Lumber grade (percent within grade)					
	Fas	Sel	1C	2C	3A	3B
3/4	--	--	--	--	--	0.7
4/4	41.8	52.5	75.0	88.1	75.7	85.9
5/4	.8	1.4	1.8	2.2	2.0	--
6/4	18.2	10.6	9.7	2.8	--	--
8/4	39.2	35.5	13.5	6.9	22.3	13.4
Total bd. ft. tally	7653	4812	3585	2510	1283	898

LOG GRADE NO. 2

3/4	--	--	--	--	0.3	--
4/4	70.2	69.3	80.8	93.4	69.5	88.3
5/4	--	.7	1.0	1.1	.2	.3
6/4	9.3	10.6	7.6	2.3	.7	--
8/4	20.5	19.4	10.6	3.2	29.3	11.4
Total bd. ft. tally	2170	3458	6423	4384	2368	1460

LOG GRADE NO. 3

4/4	85.1	85.3	92.0	91.1	69.2	87.7
5/4	1.5	1.9	1.7	3.2	.2	.5
6/4	9.4	9.0	5.5	2.6	.9	.5
8/4	4.0	3.8	.8	3.1	29.7	11.3
Total bd. ft. tally	402	737	2893	4487	2736	1524

Using current lumber prices, total value per thousand board feet (dry tally) was obtained for each log and regressions of this value over scaling diameter were computed by mill and grading method for log grades 1, 2, and 3 and construction and local-use classes.

We used the appropriate F-test to determine, for each mill, whether the variance of Modification A or B was significantly smaller than that of the standard method. If significance was attained, we computed the reduction in the one-half confidence interval for the mean value of prediction for 20 logs ($1/2\ CI_{\bar{Y}_{20}} = ts_{yx}\sqrt{1/20 + 1/n + x^2/\Sigma x^2}$). A decrease of $5.00 in this one-half confidence interval was declared meaningful and when coupled with a significant reduction in variance, provided basis for recommending adoption of the modification being considered.

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